

The EC cranes: leading the way.



LIEBHERR

How to build cranes.



The Economic cranes from Liebherr represent pioneering technology at its most impressive. They are highly versatile and can be adapted to every individual situation. These cranes are also ideally suited to confined locations, for example sites in city centres or ones where the work has to be carried out under physical or time constraints on erection.

The EC cranes are economical to relocate and swift to erect, as they consist of only a small number of complete assemblies. Only these cranes have the one-piece machine deck. This keeps erection time down to a minimum. The modern, no-compromise technical design of the EC cranes from Liebherr means reliable, economical working.

Liebherr's technically advanced production facilities guarantee that each individual crane component demonstrates maximum precision and therefore maximum reliability. Ultra-modern quality testing methods are used. Liebherr was awarded the certification for its quality management system (QM system) to DIN ISO 9001 / EN 29001 / BS 57500 Part 1 by the Certification Board of the German Technical Control Association (TÜV).

The EC cranes simply offer more.

Transportation in the correct order of assembly.

Compact transportation is an important feature of the EC cranes from Liebherr. The crane and complete ballast are transported from site to site in the correct sequence for subsequent erecting. Trucks can be unloaded and despatched in turn as they arrive at the site. Depending on their size, EC cranes can be equipped either with tower sections with a cross-section of

1.2 metres by 1.2 metres or with towers from the HC series. The tower sections with a cross-section of 1.2 metres by 1.2 metres can be transported side by side or one on top of the other on a truck.

The result: an Economic crane with a hook height of up to 36.6 m and a radius of 45 m can be transported together with its complete ballast on only three trucks.



For erection on a cruciform base with outrigger jacks and slabs, the mobile foundation blocks remain bolted on during transportation.



Operation with cruciform base on outrigger jacks with support pyramids.

The support base must occupy only as much space as allowed by the relevant authorities, occupiers of adjacent buildings and on-site conditions on city-centre building sites. In addition, it must comply with permissible ground pressure limits. To fulfil these requirements, cruciform bases for Economic cranes from Liebherr are available with various dimensions and designs. The cranes can be installed with a cruciform base on outrigger jacks with foundation slabs, on outrigger jacks with support pyramids, on foundation frames, on rails, on portals or with fixing angles.

The cruciform base is assembled in a few simple steps.



For operation on rails, the cruciform base can be equipped with crane travel gear. EC cranes can also be used with an undercarriage from the HC range.



Pointing the way: transportation.

The versatility of the support bases.

Assembly direct from the truck.

The EC cranes are assembled simply, quickly and with a minimum of manual effort. On city-centre crane applications, the available assembly time is usually limited by the relevant construction and traffic authorities or occupiers of adjacent buildings. Traffic flow and access to shops and car parks etc. must not be interrupted, or only very briefly. An important requirement for crane operation at such sites is therefore extremely fast assembly. Liebherr Economic cranes can be erected in the shortest possible time.

The erecting procedure for Economic cranes is particularly simple, with no need for intermediate component storage at the site. After quick and straightforward assembly of the cruciform base, the tower is assembled next, straight from the truck.

Two criteria determine the tower cross-section of gap-filling cranes such as these; the elevator shaft dimensions and the loading width and height of the truck platform. Therefore the crane tower of the Economic cranes from Liebherr has as cross-section of 1.2 metres by 1.2 metres. The maximum tower section length is 12 m. Thus the possible truck loading length is fully used. Tower sections of 3 m and 6 m length are also available for better adaptability to the building heights. For bigger hook heights EC cranes are equipped with towers from the HC series which is possible due to the Liebherr modular design principle.

Only two bolts per corner, subject only to tensile loads, are required for each tower connection. The tower butt joints are quick to assemble and absolutely free from play. The tower is lifted on the cruciform base in a single movement.



Erection: swift and easy.



The top tower section is unfolded and pinned in position while still on the truck. The counter-jib guying is installed at the same time.

Then the one-piece machine deck is placed on the crane tower in a single lifting movement. EC cranes can be erected in any direction. Once the power supply cable has been connected the electrical equipment is fully installed and ready for operation. The crane can already be slewed at this stage, to pick up the counter-weight and jib from any side. This is important, since truck cranes cannot be called on for assistance in restricted areas.



**The heart of EC-series cranes:
the one-piece machine deck.**



An exemplary solution: the one-piece machine deck on EC cranes.

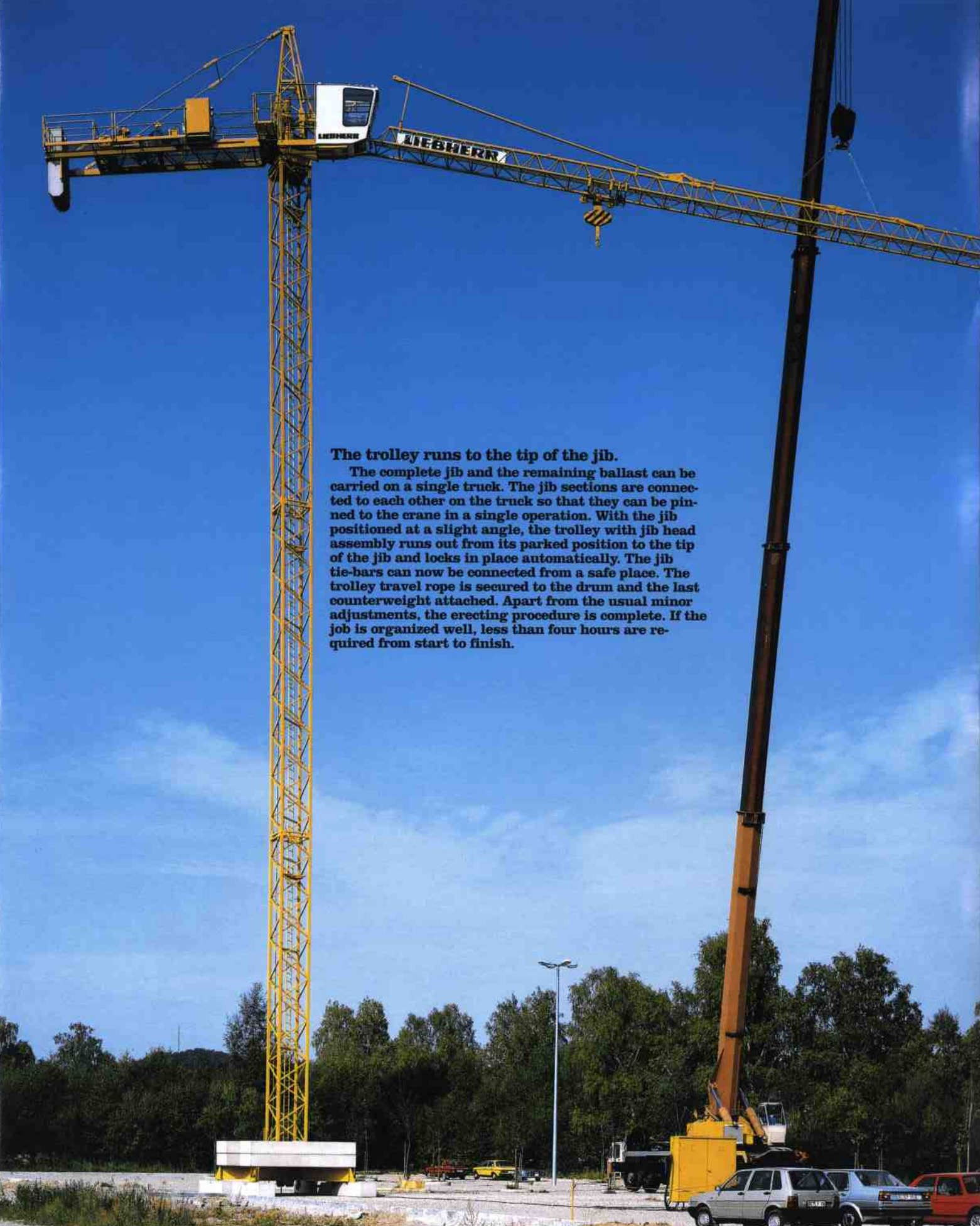
The one-piece machine deck on EC cranes is a technological masterpiece. This single element combines all the major crane components in ready-to-operate form with all ropes and electrical connections installed: the counter-jib with tie-bars, the tower head, slewing platform, ball slewing ring with mounting, crane cab, slewing gear, hoisting gear, trolley travel gear, switchgear cabinets, trolley, load hook and jib head assembly. If required, the machine deck can also be divided into smaller assemblies, for example when erecting by helicopter. In this case the EC crane can be equipped with plug connections for all cables from the slewing platform to the counter-jib.

The one-piece machine deck is transported and erected as a single unit. The entire assembly fits on just one truck and still leaves room for a counterweight and two or four central ballasting slabs, depending on the size of the crane.

Liebherr Economic cranes have no assemblies installed in the tower or jib. Until now, such rapid assembly procedures have been achieved only with fast-erecting cranes.



Pointing the way: the one-piece machine deck.



The trolley runs to the tip of the jib.

The complete jib and the remaining ballast can be carried on a single truck. The jib sections are connected to each other on the truck so that they can be pinned to the crane in a single operation. With the jib positioned at a slight angle, the trolley with jib head assembly runs out from its parked position to the tip of the jib and locks in place automatically. The jib tie-bars can now be connected from a safe place. The trolley travel rope is secured to the drum and the last counterweight attached. Apart from the usual minor adjustments, the erecting procedure is complete. If the job is organized well, less than four hours are required from start to finish.



The trolley travels out the jib head assembly to the jib tip.



After the jib head assembly has locked itself at the jib tip, the trolley runs back and the trolley travel rope is electrically tensioned.

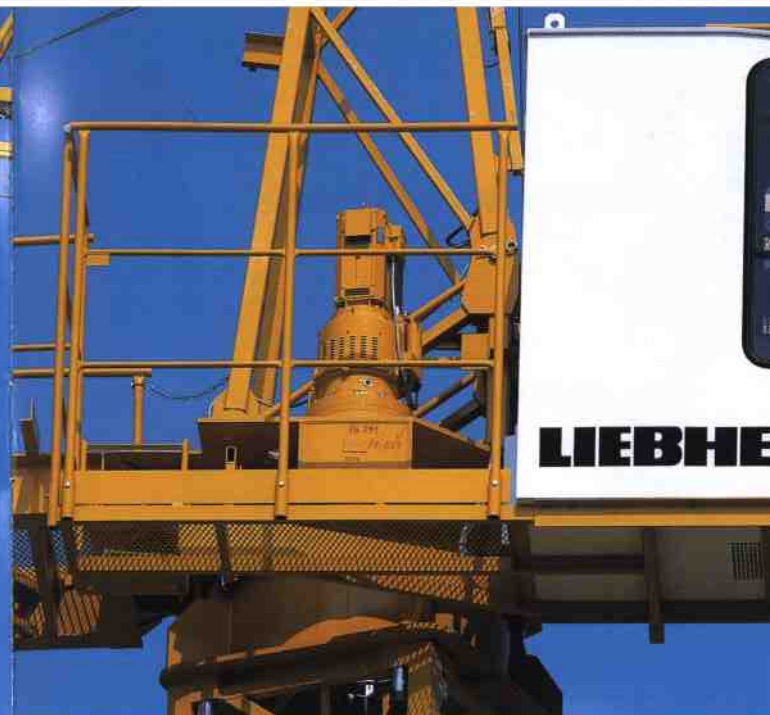
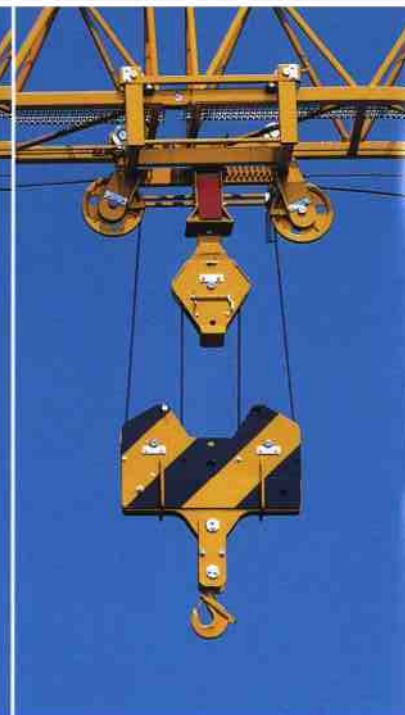
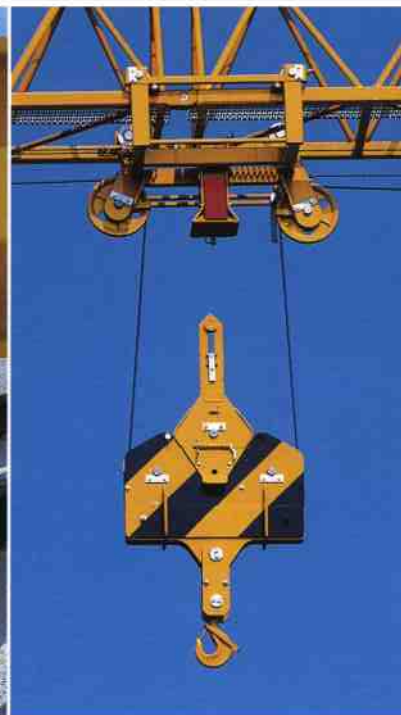


Working from a safe place, the jib tie-bars are connected.



The rest of the counterweight is attached.

**Pointing the way:
the entire crane erection.**



The crane travel gear.

The cruciform base can be equipped with travel gear for rail track mounting. Thanks to Liebherr's modular-element system, combination with a curved-track undercarriage from the HC range is also possible.

Automatic hoist rope re-reeving.

Economic cranes up to 80 mt are equipped with automatic hoist rope re-reeving. Without leaving the cab or requiring any outside assistance, the crane operator can switch from double to quadruple rope reeving – and back again whenever necessary. In this way, the correct and most economical combination of lifting force and speed can be selected for each individual load handling cycle – a big factor in increasing effective performance.

The slewing gear.

The slewing gear ensures precise movements of every load: large or small, light or heavy, bulky or compact, when slewing with or against the wind – or in completely calm weather. The crane operator can vary the slewing movement at any time by altering the drive or braking torque. Due to the slipping unit, which is a standard equipment, these cranes can slew unrestrictedly in either direction.

Two-fall operation.

The EC crane in the 90 metre-ton class has a hoist system with an electromagnetic-shift spur gearbox. This means that all loads can be raised when double-reeved – even the maximum load. This keeps operation rapid and economical at greater hook heights.



Hoisting and trolley travel gear.

EC cranes up to 80 mt are equipped with various types of hoist gear drive: squirrel-cage motors or slipping motors with an eddy current brake. And automatic hoist rope re-reeving as well. Thus the most economical combination of lifting force and speed is available for each individual load handling cycle.

The trolley travel gear is driven by a three-speed pole-changing squirrel-cage motor with a self-adjusting brake of ample size. Careful choice of running speeds ensures jerkfree trolley movement. Once again, there is automatic shift to the lower speed just before the trolley reaches its maximum radius. This prevents the trolley from striking the stops at the outer end of the jib if it is carelessly run out at high speed, and avoids dangerous load swinging movements.

The hoist gear of the EC cranes in the 90 metre-ton class.

The bigger EC cranes have hoist gears with a triple pole-changing squirrel-cage motor with 2-speed Elmag and angular and planetary gearbox or slipping motor with forced ventilation, eddy current brake with 1:15 speed reduction, three-speed Elmag gearbox, spring-loaded, self-adjusting disc brake, angular and planetary gearbox and rope drum with LS grooves. The individual gears can be selected under load from the control desk by actuating the electromagnetic multiple disc clutches. Thus optimum speeds are immediately available for each load. All loads – even the maximum load – are raised double-reeved.

Pointing the way: performance.



From the cab with its unrestricted view, the crane operator can see the load and the entire working area. A glazed panel in the cab floor enables him to see the base of the tower.

The cab houses all the controls, offering a comfortable workplace with a full view of the load and the site. The panoramic cab has extensive noise and thermal insulation. The controls for all crane functions are integrated into the seat. The seat itself has a wide range of adjustment positions.

The electronic display unit, or, if the Litronic crane control system installed, the flat display of the electronic monitoring

system (EMS), is located in a logical position at the front left. If requested, the EC crane can also be equipped with all other electronic modules such as load moment limiting system, operating-range restriction system, anti-collision system and operating data recording system.

The heating and ventilation system is integrated in the new control station. Thermostat control maintains an even temperature. And a timer switch provides for daytime/nighttime control. A window washer/wiper system and sun blinds at the sides and front complete this luxury equipment.



The ever-shorter working periods demanded on the modern high-technology construction site require fast, precise crane working movements. This is particularly true on inner-city, urban redevelopment and building-gap construction sites, where loads often need to be lifted over existing buildings or in close proximity to frontages, windows, moving traffic or overhead power lines before being set down where needed.

Liebherr EC cranes move loads with exceptional precision to the exact point required, even in strong winds. Fabricated from tight-welded, symmetrical box sections, these cranes are extremely stable, even during operation. Their high level of stability is enhanced by tower connections that are free from play.

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